

**Department of Elementary and
Secondary Education**

**Missouri Preschool Project
Child Assessment Report**

By Kathryn L. Fuger, Ph.D.
Melissa L. Todd, B.A.
Dawana J. Stephens, B.A.
University of Missouri-Kansas City
Institute for Human Development
A University Center for Excellence
on Developmental Disabilities

And

Kathy R. Thornburg, Ph.D.
Michelle Mathews, M.S.
Wayne Mayfield, Ph.D.
University of Missouri-Columbia
Center for Family Policy and Research

July 2003

Table of Contents

Introduction	1
Assessment Participants	1
General Procedures	1
Instrumentation	2
Mathematical Assessment.....	2
Conventional Knowledge Assessment.....	3
Receptive Language Assessment	4
Reading-Related Skills Assessment.....	4
Social Skills Assessment.....	5
Child Assessment Findings	5
Mathematical Assessment.....	5
Applied Mathematical Assessment	8
Conventional Knowledge.....	10
Receptive Language Assessment	11
Assessment of Letter-Word Recognition	13
Assessment of Other Reading-Related Skills.....	15
Social Skills Rating System Assessments by Parents and Teachers.....	16
Parent Assessment of Child Social Skills.....	16
Teacher Assessment of Child Social Skills.....	17
Comparison of Parent and Teacher Social Skills Assessments of the Same Children	19
Parent Assessment of Problem Behaviors.....	20
Teacher Assessment of Problem Behaviors	20
Comparison of Parent and Teacher Assessments of Problem Behaviors	23
Findings about the Treatment and Comparison Groups	23
Child Comparisons.....	24
Creation of a Matched Comparison Group	24
Child Assessment Outcomes	24
Summary	26
References	27

Table of Tables

Table 1	Mathematical Card Identification and Strategies Employed.....	6
Table 2	Comparison of Mathematical Cards and Primary Strategies Employed	7

Table 3	Addition of Mathematical Cards and Strategies Employed	8
Table 4	Applied Math Assessment Results (WJ-III Applied Problems).....	9
Table 5	Percentage of Correct Answers on Shapes, Colors, and Letters	11
Table 6	Receptive Language Assessment Results (PPVT-III).....	12
Table 7	Literacy Assessment Results (WJ-III Letter-Word Identification)	14
Table 8	Social Skills Assessment by Parents	17
Table 9	Social Skills Assessment by Teachers	18
Table 10	Problem Behaviors Assessment by Parents	20
Table 11	Problem Behaviors Assessment by Teachers.....	21
Table 12	Mean Standard Scores on Child Assessments for Treatment and Comparison Groups.....	25

Table of Figures

Figure 1	Percentages of Applied Math Standard Score Groupings (WJ-III Applied Problems).....	9
Figure 2	Percentages of Receptive Language Standard Score Groupings (PPVT-III).....	13
Figure 3	Percentages of Literacy Standard Score Groupings (WJ-III Letter-Word Identification).....	14
Figure 4	Percentages of Standard Score Groupings for the Applied Math, Receptive Language, and Literacy (WJ-III Applied Problems, PPVT-III, and WJ-III Letter-Word Identification).....	15
Figure 5	Percentages of Behavior Domain Groupings for the Parent and Teacher Ratings of Social Skills	18
Figure 6	Percentages of Standard Score Groupings for the Parent and Teacher Ratings of Social Skills.....	19
Figure 7	Percentages of Behavior Domain Groupings for the Parent and Teacher Ratings of Problem Behavior	22
Figure 8	Percentages of Standard Score Groupings for the Parent and Teacher Ratings of Problem Behavior	23

Department of Elementary and Secondary Education Missouri Preschool Project Child Assessment Report July 2003

Introduction

Assessment Participants

This report describes the child assessments conducted with 390 pre-kindergarten children attending Missouri Preschool Project (MPP) centers. Eligible children were defined as 4- and 5-year-old children who had attended a MPP program for a minimum of 1 year, who would be eligible for kindergarten during the school year following the assessment. Their ages ranged from 4 years 7 months to 5 years 11 months at the time of the assessment, with a mean age of 5 years 3 months 9 days.

Altogether, the sample included 194 girls (49.7%) and 196 boys (50.3%). Thirty-eight of the 390 children (9.7%) were already identified by either the parent or the teacher as having special needs, with 16 (4.1%) known to receive special education services.

General Procedures

Parent consent forms were distributed to parents of eligible children attending the classrooms where both pre- and post-assessments of program quality were conducted. When at least half of the parent consents were returned to the teacher, four consent forms were randomly selected by the assessor. The assessor scheduled a time to assess those 4 children at the early childhood program.

Generally the assessments occurred in a more isolated area of the program facility. After engaging the child and receiving the child's permission to begin, the assessor completed the battery of assessment instruments. The instruments were randomly ordered in each assessment packet, with the intent of negating any bias based on the order in which they were conducted. If the child refused to do one portion of the assessment, the next portion was offered. If the child became restless or unwilling to participate, the assessment was concluded. At the conclusion of the assessment, the assessor escorted the child back to the teacher.

After completion of the child assessments, the assessor asked the child's teacher to complete a *Social Skills Rating System* teacher form. A parent packet was given to the teacher to place with the other materials that children take home to their parents. The parent packet included a *Social Skills Rating System* parent form and a parent questionnaire. The teacher and parent social skills forms were returned by direct mail to the university, after which time gift cards for participating were sent to them.

A similar process was followed in the selection of a comparison sample. The comparison group included 4- and 5-year-old children attending programs that were participating in the Workforce Incentive project. Children met the same criteria of being eligible for kindergarten, based on their birth dates, during the fall of the year following the child assessment.

Instrumentation

Based on the recommended principles from the National Education Goals Panel, a performance-based authentic assessment was designed for the purpose of evaluating the developmental status of the kindergarten children in the study. The assessment included components of the *Project Construct Assessment System* (MO Department of Elementary and Secondary Education, 1998) the *Peabody Picture Vocabulary Test-Third Edition* (Dunn, Dunn, & Dunn, 1997), the *Woodcock-Johnson III* (McGrew & Woodcock, 2001), *Story and Print Concepts* (Mason & Stewart, 1989), and the *Social Skills Rating System* (Gresham & Elliott, 1990). These measures were selected due to their merits in these areas:

- their developmental appropriateness for young children,
- their coverage of various domains of child development,
- their cultural sensitivity,
- their usage of multiple and diverse sources of information,
- the degree to which interruption to the daily routines of children, classrooms, and families would be minimized, and
- the availability of other datasets with which the outcomes can be compared.

The combined instruments assessed these five key domains: mathematical knowledge and skills, conventional knowledge, receptive language, reading-related skills, and social skills.

Mathematical Assessment

Project Construct Assessment Activity: Flip (Card Game). The child's understanding of numerical relationships is determined by administering a hands-on card game, the Flip Game, designed by the authors of Project Construct (MO Department of Elementary and Secondary Education, 1998). Children demonstrate their mathematical knowledge by identifying numerals 1 to 10, counting by rote to 10, playing a card game to determine the highest cards, counting remaining cards, and playing a second card game in which two cards are dealt at a time (requiring addition skills). Throughout the activities, the assessor asks the child such questions as: *How did you know which was more? How did you figure that out? and How can you tell how many without counting?*

The assessor documents both the answers given by the child and the processes by which the child determines answers, providing more in-depth clues to the child's developmental level. By the conclusion of both activities, the assessor understands the child's numerical problem-solving ability and whether the child grasps one-to-one correspondence, basic addition, the association of quantity with numeral recognition, and quantitative concepts. This instrument is not normed, but the scoring reflects a qualitative analysis of child behavior. It is important to note that this approach differs from the standardized testing in its focus on the processes

used by the child to solve mathematical problems. The authors emphasize the importance of the strategies employed by the children, as well as the correctness of their solutions in assessing children's knowledge and skill development. For this reason, this instrument was selected to complement the following standardized assessment.

Woodcock-Johnson III (WJ-III): Applied Problems. The *Applied Problems* section of the *WJ-III* measures skills in analyzing and solving practical problems in mathematics. Children demonstrate the following skills:

- identify correct number of objects on a page,
- choose appropriate mathematical operations (addition or subtraction),
- identify time on an analog clock,
- identify and calculate money,
- identify temperature on a thermometer, and
- demonstrate an understanding of the concepts of *more than* and *less than*.

Each item is given a score of 0 or 1, and the sum of these is labeled the Raw Score. The Raw Score is converted into a Standard Score, which enables children's scores to be compared with the scores of other children in the nation, with 100.0 being the national norm. In addition, the participants are given a Percentile Rank, which also compares the children to the normative sample. If a child were ranked at the 60th percentile, this would mean that the assessed child scored higher than 60% of the children in the psychometric testing of the instrument. The Age Equivalent Score indicates the average age of children in the normative sample that achieved the same score as the assessed child. The difference between the Age Equivalent Score and chronological age will be determined for each child and averaged for this evaluation.

Conventional Knowledge Assessment

Project Construct Assessment Activity: Pretend Party. In this assessment, the assessor presents the child with the objective of planning a "pretend party." In the course of designing an invitation, the child is given the opportunity to share such personal information as name, address, telephone number, birth date, and the names of family and friends. The child's ability to write his or her name is also recorded. As in the administration of the *Flip Game*, the focus is not on the legibility of handwriting, the correctness of spelling, the accuracy of information, or the number of details recalled by children. Instead, the assessment information from *Pretend Party* provides an overview of the child's self-awareness with regard to constructs of time, place, and one's relationships with others. These findings are basically descriptive in nature, giving a snapshot of the way a child organizes conventional knowledge at this point in time.

Shape, Color, and Letter Identification. Then the assessor instructs the child to identify 3 shapes, 5 colors, and 12 letters as each is presented. Standardized norms are not available for this instrument. However, the instrument contributes valuable information associated with teacher expectations of child readiness for school.

Receptive Language Assessment

Peabody Picture Vocabulary Test, Third Edition (PPVT-III). The *PPVT-III* is a standardized test of listening comprehension for the spoken word in Standard English. It does not require any reading or oral responses, and the administration of the test is not timed. The *PPVT-III*, comprised of 17 sets of 12 items presented in order of increasing difficulty, can be administered to persons from 2.5 years of age through adulthood. Children view a set of four black-and-white illustrations on a page and select the illustration that matches the word spoken by the assessor. The test requires the establishment of a basal set and a ceiling set for measurement. The test has two purposes: First, the *PPVT-III* measures receptive vocabulary, serving as an achievement test of the person's level of vocabulary acquisition. Second, the *PPVT-III* serves as a screening test of verbal ability, or as one element in a series of cognitive tests. For this purpose it can only be used if English is the first spoken language of the child. Once the Raw Score is determined, a number of standardized scores can be computed with reference to the child's chronological age at the time of assessment. The Standard Score and the Percentile Rank are deviation-type norms that indicate how greatly the individual's performance differs from the average of individuals the same age who participated in the test standardization. In addition, a developmental-type norm identifies the placement of the individual's performance on a developmental curve. For the *PPVT-III*, this norm is the Age Equivalent. In this report the Age Equivalent Score of each child is compared to the child's chronological age, and the difference is reported.

Reading-Related Skills Assessment

Story and Print Concepts. This activity is a component of the Comprehensive Assessment Program from the *Early Childhood Diagnostic Instrument* (Mason & Stewart, 1989), which has been adapted for incorporation in the Head Start Family and Child Experiences Survey (FACES) (FACES Research Team, 1997). It allows the assessor to determine the child's ability to respond to literature, to demonstrate an understanding of the conventions of print, to exhibit book-handling skills, and to show correspondence between written and spoken language. The assessor begins by handing *Goodnight, Moon* (Brown & Hurd, 1947) to the child upside down and backwards. Such book-handling skills as distinguishing front cover from back cover, turning to the first page of the story, and determining where print begins and ends are assessed by instructing the child to "Show me the front of the book," "Now open it up for us to read," and "Point to where I should start to read." As the assessor reads the story, the child is also asked a number of open-ended questions to assess the child's listening skills and ability to recall events in the story.

Woodcock-Johnson III (WJ-III): Letter-Word Identification. This portion of the *WJ-III* measures the child's broad and basic skills in reading. Children match a rebus with an actual picture of the object and identify isolated letters and words. Children receive scores of 0 or 1 for each item. The total scores are converted to Standard Scores, Percentile Ranks, and Age Equivalent Scores.

Social Skills Assessment

Social Skills Rating System (SSRS): Parent and Teacher Forms. The *SSRS* is a normed multi-rater assessment of student social behaviors that can affect teacher-student relations, peer acceptance, and academic performance. These forms are used to assess the three domains of *Social Skills* and *Problem Behaviors*. Subscales measured within the *Social Skills* domain include *cooperation*, *assertion*, *responsibility* (rated by parents only), and *self-control*. Two subscales within the *Problem Behaviors* domain are measured: *externalizing problem* and *internalizing problems*. Individual Raw Scores and a comparison of the child's behavior level with same-sex preschool peers are calculated. The Raw Scores are converted to Standard Scores and Percentile Ranks. While the *SSRS* provides meaningful and dependable information for a variety of purposes, its uses in this study are to gather information about the child from multiple sources and to include social skills in the comprehensive child assessment.

Child Assessment Findings

Child assessments conducted by trained assessors and social skills ratings of pre-kindergartners completed by parents and teachers are presented in this section. In the sections that follow, information is summarized from parent questionnaires, including demographic information about the families and children, and information about previous early childhood experiences.

Mathematical Assessment

The children engaged in an activity called the *Flip Game*, participating in five mathematical tasks to determine their ability to construct numerical relationships. All activities used playing cards numbered from 1 to 10 with corresponding diamonds. In the first activity, the assessor presented each card (1 to 10) in random order, asking the child to identify the number. The assessor recorded the correctness of the child's answer and the strategies used to recognize the numerical value of the card.

Of 388 children, only 6 (1.5%) were unable to recognize any of the numbers, while 188 children (48.5%) correctly recognized some of the numbers, and 194 children (50.0%) correctly recognized all 10 of the numbers. The strategy most commonly used by children to determine the correct answer was recognition of the numeral. The number of correct answers ranged from 0 to 10, with children correctly recognizing a mean of 8.3 cards. The largest rate of error occurred for numeral 9, with 150 of 388 children (38.9%) answering incorrectly. Table 1 summarizes both the percentages of children correctly answering each item and the frequency with which the children used each strategy. In some instances strategies were not recorded for an assessed child; this accounts for differences in sample size between the "Correctly Answered" column and the right columns.

Table 1.

**Mathematical Card Identification and Strategies Employed
(n=388)**

Type of Card	Correctly Answered % (n)	Refuses to Participate % (n)	Says He/She Doesn't Know % (n)	Guesses or Gives Random Answer % (n)	Recognizes by Sight or Perception % (n)	Counts the Diamonds % (n)	Recognizes the Numeral % (n)
One Diamond	96.4% (374)	1.0% (4)	0.0% (0)	2.6% (10)	13.8% (53)	5.5% (21)	77.1% (296)
Two Diamonds	93.6% (363)	1.8% (7)	0.0% (0)	4.2% (16)	12.5% (48)	6.3% (24)	75.2% (288)
Three Diamonds	90.7% (352)	2.9% (11)	0.5% (2)	5.2% (20)	11.5% (44)	9.4% (36)	70.4% (269)
Four Diamonds	91.8% (356)	2.3% (9)	0.3% (1)	5.2% (20)	11.9% (46)	9.4% (36)	70.9% (273)
Five Diamonds	90.2% (350)	2.6% (10)	0.3% (1)	5.7% (22)	11.4% (44)	7.5% (29)	72.5% (279)
Six Diamonds	74.7% (290)	6.1% (23)	0.8% (3)	13.2% (50)	10.8% (41)	12.4% (47)	56.7% (215)
Seven Diamonds	79.9% (310)	6.0% (23)	1.3% (5)	9.7% (37)	10.5% (40)	10.5% (40)	61.8% (236)
Eight Diamonds	78.9% (306)	5.5% (21)	0.8% (3)	12.1% (46)	10.5% (40)	11.8% (45)	59.3% (226)
Nine Diamonds	61.1% (237)	11.1% (42)	1.6% (6)	17.7% (67)	8.7% (33)	16.4% (62)	44.4% (168)
Ten Diamonds	71.1% (276)	8.4% (32)	1.0% (4)	14.4% (55)	9.2% (35)	12.6% (48)	54.3% (207)

Two activities assessed the children's counting abilities. When asked to count to 10 by rote, 358 of the 389 assessed children (92.0%) counted to 10 correctly, with 7 (1.8%) counting to 10 with one or two errors. Seventeen children (4.4%) were unable to count to 10, and 7 (1.8%) refused to participate. When the children were asked to count a stack of cards acquired in the *Flip Game*, 295 of 379 children (77.8%) correctly counted the cards using one-to-one correspondence, while 37 children (9.8%) counted by rote, 33 children (8.7%) skipped some cards, 13 children (3.4%) counted some cards more than once, 24 children (6.3%) counted randomly, 11 children (2.9%) were unable to count the cards, and 5 (1.5%) refused to participate.

Another activity in the math assessment, played as a two-person card game, involved the assessor asking the child to identify the highest value between two cards in 10 respective comparisons. The assessor also questioned the child to determine the strategies used to obtain an answer. Three hundred seventy-eight completed this activity, correctly solving a mean of 8.6 of the 10 sets; 184 children (48.7%) completed all 10 sets correctly, while 80 (21.2%) completed 9 sets correctly, 44 (11.6%) completed 8 sets correctly, and the other 70 (18.5%) completed from 0

to 7 correct sets. Table 2 presents the findings for this activity, including the percentage of children correctly solving each set and the primary strategy each child employed. In some instances the assessors did not note the primary strategy used, accounting for variability in sample size.

Table 2.

**Comparison of Mathematical Cards
and Primary Strategies Employed
(n=381)**

Set	Correctly Answered ^a % (n)	Says He/She Doesn't Know % (n)	Guesses or Calls Out at Random % (n)	Relies on Perception % (n)	Counts Randomly % (n)	Counts Each Diamond Accurately % (n)	Compares Numerals % (n)	Other or Unknown % (n)
Set 1 (2,1)	95.3% (363)	0.0% (0)	8.0% (30)	24.4% (92)	0.0% (0)	4.5% (17)	61.0% (230)	2.1% (8)
Set 2 (10,5)	93.4% (356)	0.0% (0)	8.8% (33)	34.8% (131)	2.7% (10)	4.5% (17)	47.1% (177)	2.1% (8)
Set 3 (1,8)	88.7% (338)	0.0% (0)	9.3% (35)	36.7% (138)	0.8% (3)	3.2% (12)	47.9% (180)	2.1% (8)
Set 4 (7,7)	78.2% (298)	0.0% (0)	12.1% (45)	18.8% (70)	0.5% (2)	6.2% (23)	59.9% (223)	2.4% (9)
Set 5 (9,6)	77.7% (296)	0.0% (0)	11.1% (41)	32.6% (120)	1.6% (6)	9.5% (35)	42.4% (156)	2.7% (10)
Set 6 (5,4)	91.1% (347)	0.0% (0)	8.9% (33)	28.2% (104)	1.1% (4)	6.0% (22)	53.9% (199)	1.9% (7)
Set 7 (8,10)	68.8% (262)	0.0% (0)	16.6% (61)	29.9% (110)	1.6% (6)	7.9% (29)	41.8% (154)	2.2% (8)
Set 8 (6,3)	92.4% (352)	0.0% (0)	8.2% (30)	34.6% (126)	1.4% (5)	5.2% (19)	48.1% (175)	2.5% (9)
Set 9 (4,9)	85.8% (327)	0.0% (0)	8.7% (32)	35.5% (130)	2.2% (8)	4.9% (18)	45.9% (168)	2.7% (10)
Set 10 (2,3)	80.6% (307)	0.0% (0)	11.2% (41)	25.2% (92)	0.8% (3)	4.9% (18)	55.3% (202)	2.5% (9)

The final math game involved dealing two cards to both the assessor and the child, with the child being instructed to determine who has the cards that add up to more. Of the four sets, 359 children correctly answered a mean of 2.6 sets, with 133 children (37.0%) answering all sets correctly, 32 children (8.9%) answering three correctly, 133 (37.0%) answering two correctly, 32 (8.9%) answering one correctly, and the remaining 29 children (8.1%) giving zero correct answers. Children employed a variety of strategies to solve the sets, with the largest number, 98 of 378 (25.9%), adding sums by counting all the diamonds on both cards. Eighty-five children (22.5%) made judgments based on their perception of which set was greater. Table 3 displays

the children's rate of success and the dominant strategy used by each child to complete this activity. Note that the sample size for the number of children who completed each set is larger than the sample size of recorded strategies used; this is due to the fact that dominant strategies were not identified in some instances. Not all children continued with this more challenging mathematical task through to completion of all four sets.

Table 3.

**Addition of Mathematical Cards and Strategies Employed
(n=358)**

Set	Correctly Answered % (n)	Guesses or Calls Out at Random % (n)	Relies on Perception % (n)	Counts All Diamonds % (n)	Counts On from First Card % (n)	Knows Sum % (n)	Other or Unknown % (n)
Set 1 (2+3, 1+2)	86.9% (311)	12.1% (43)	25.9% (92)	26.5% (94)	20.8% (74)	7.3% (26)	7.3% (26)
Set 2 (2+2, 3+1)	42.2% (358)	17.7% (63)	19.4% (69)	29.6% (105)	20.6% (73)	3.7% (13)	9.0% (32)
Set 3 (3+1, 1+2)	85.2% (305)	15.9% (56)	23.8% (84)	26.7% (94)	21.0% (74)	5.1% (18)	7.4% (26)
Set 4 (2+4, 3+3)	44.4% (159)	18.6% (65)	17.8% (62)	30.1% (105)	22.6% (79)	2.6% (9)	8.3% (29)

Applied Mathematical Assessment

The *WJ-III Applied Problems* assessment was used to determine children's skills with regard to broad mathematics, reasoning, and simple mathematical operations. The children's performance was conceptualized in terms of a Standard Score, which is normed at 100.0.

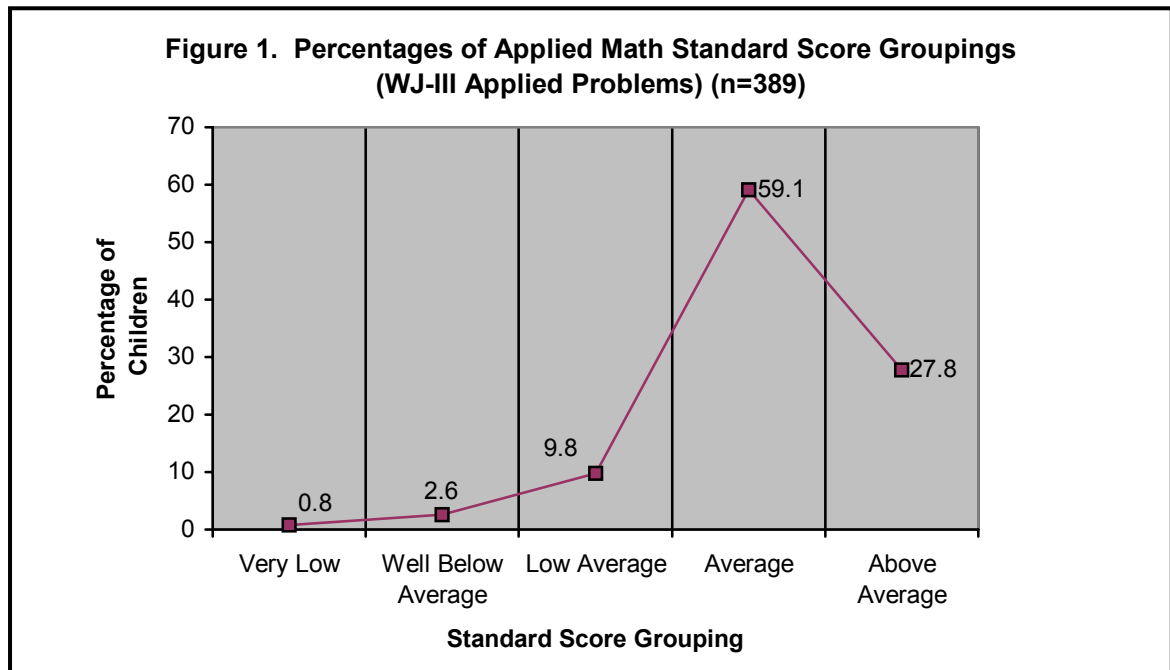
The children correctly answered an average of 15.8 items, with the number of correct answers ranging from 2 to 32 correct answers. Standard Scores ranged from 49 to 154, with a mean score of 102.7 for the 389 assessed children. This equated to children performing at the 55th percentile, on average. The chronological age ranged from 55 months to 71 months, with a mean age of 63 months 9 days for the 389 assessed children, while Age Equivalent Scores ranged from 30 months to 117 months (mean of 64 months 18 days). In other words, the children performed at the level of children 1 month 9 days older than their ages, on average. Two hundred twenty-six of the 389 assessed children (58.1%) achieved an Age Equivalent Score equal to or greater than their chronological age. Table 4 summarizes the results of this assessment.

Table 4.

**Applied Math Assessment Results (WJ-III Applied Problems)
(n=389)**

WJ-III Applied Problems Deviation-Type Norms		WJ-III Applied Problems Developmental-Type Norm Information		
Mean Standard Score ^a	Mean Percentile Rank ^b	Mean Age Equivalent Score ^c	Mean Chronological Age ^c	Mean Difference: Age Equivalent Score and Chronological Age ^c
102.7	55.4	64.6	63.3	+1.3
^a Standard Score is normed with a mean of 100.0 ^b Percentile Rank is normed with a mean of 50.0 ^c In months				

To determine the incidence of children achieving at remedial levels, the Standard Scores were grouped, as shown in Figure 1. According to the technical manual for the *WJ-III*, scores between 90 and 110 are "average," scores between 80 and 89 are "low average," scores between 70 and 79 are "low, i.e., well below average" and scores 69 and below are "very low." Accordingly, 38 of the 388 children (9.8%) scored low average, 10 (2.6%) scored well below average, and 3 (0.8%) scored even lower. This equates to a total of 51 children (13.2%) below the average range.



Conventional Knowledge

The Conventional Knowledge assessment provided opportunities for the children to share relevant information about themselves. While all of the children participated in this assessment, the uniqueness of their responses and characteristics of the scoring sheet led to challenges in reporting this information. When assessors left items blank, it is likely that the child could not perform this activity. However, in some instances the distinction between omission of the activity, inability of the child to complete the activity, and shyness or unwillingness of the child to complete the activity could not be made.

During the creation of a pretend party invitation, the assessor asked the child to recite his or her entire name. Two hundred ninety-nine of 389 children (76.9%) stated their entire name, first and last, while 77 (19.8%) stated their first name only. When asked to write their names, 128 of the 389 assessed children (32.9%) could write both their first and last names, while 219 (56.3%) wrote either a first or last name. Seventeen children (4.4%) wrote random letters, 7 (1.8%) wrote their initials, and 5 (1.3%) scribbled something else.

The children's knowledge of their addresses produced a wide range of responses. Only 46 of 383 children (12.0%) could recite their entire street address, including street name, street number, and city name. Many of the children could recite some portion of their address: 28 children (7.3%) recited part of their street address with the city name, 20 (5.2%) recited their street name and number, 6 children (1.6%) recited their street number only, 29 (7.6%) recited their street name only, and 52 (13.6%) recited their city name only. In addition, 181 of the 384 children (47.3%) stated that they did not know, while 4 children (1.0%) did not answer for some other reason. When asked separately what city they lived in, 228 of 382 children (59.7%) named the city in which they resided, 128 (33.5%) reportedly did not know, 8 (2.1%) named their state, but not their city, and 19 (5.0%) gave other incorrect answers.

In recalling their telephone numbers, 173 of 383 children (45.2%) recited their entire 7-digit number in correct sequence. Three children (0.8%) recited the entire number with an incorrect sequence, 28 children (7.3%) recited a partial number, and 25 children (6.5%) recited random numbers. One hundred forty-one children (36.8%) stated that they did not know their phone number, while 4 children (1.0%) stated that they did not have a telephone in their home. In 9 instances (2.3%), children did not answer correctly for some other reason.

Under the premise of a pretend birthday party, assessors asked the children their birth date. In only 9 of 384 instances (2.3%) could children recall their entire birth date correctly (including date, month, and year). In 212 instances (55.2%), the children could recall some combination of the date, with only two of the three components being correct; 50 children (13.0%) recalled only one component (month only, date only, or year only). Again, a large number of children, 96 (25.0%), stated that they did not know. Seventeen children (4.4%) did not provide their birth date for some other reason.

The assessors asked each of the children to generate a list of people to invite to their pretend party, without prompting the children concerning particular guests to invite. Assessors documented the guests cited by each child in the following categories: parents/guardians,

siblings, grandparents, others in extended family, friends, or others. Three hundred eighty-nine children invited people from a mean of 2.3 of these categories, with all but 15 children (3.9%) inviting at least one person to the party. Inviting friends amassed the most responses, as 331 of 389 children (85.1%) chose to invite friends, while 160 children (41.1%) chose to invite their parents. With regard to the remaining categories, 118 children (30.3%) invited siblings, 105 children (27.0%) invited other extended family members, 96 children (24.7%) invited grandparents, and 72 children (18.5%) invited others. Nine of the 390 children (2.3%) stated that they did not know who to invite, and 3 (0.8%) refused to participate.

The assessors also documented other conventional knowledge by having the children identify shapes, colors, and letters. Of 389 children, 305 (78.4%) correctly identified all three shapes presented to them, with 55 (14.1%) identifying two shapes, 22 (5.7%) identifying one shape, and 7 (1.8%) unable to identify any shapes. This resulted in a mean of 2.7 and an average of 89.7% of the shapes being correctly identified by the children. From the presented colors; 366 of 389 children (94.1%) were able to identify all five colors correctly, 18 children (4.6%) could identify three or four colors, and 4 children (1.0%) could identify one or two colors, with only 1 child (0.3%) unable to correctly identify any colors. This equates to a mean of 4.9 colors and a success rate of 98.0% in color recognition.

Children varied in their identification of the 12 presented letters, correctly identifying from 0 to 12 letters, resulting in a mean of 9.1 correct letters for 389 children and a success rate of 76.0%. All 12 letters were identified by 183 of those children (47.0%), 109 (28.0%) identified 7 or more letters, and 84 (21.6%) identified up to 6 letters. Only 13 children (3.3%) were unable to identify any letters. Table 5 summarizes the information about the children's identification of shapes, colors, and letters.

Table 5.

**Percentage of Correct Answers on Shapes, Colors, and Letters
(n=389)**

	No Correct Answers % (n)	≤Half Correct Answers % (n)	> Half Correct Answers % (n)	All Correct Answers %(n)	Mean Percentage of Correct Answers
Shapes	1.8% (7)	5.1% (22)	14.1% (55)	78.4% (305)	89.7%
Colors	0.3% (1)	1.0% (4)	4.6% (18)	94.1% (366)	98.0%
Letters	3.3% (13)	21.6% (84)	28.0% (109)	47.0% (183)	76.0%

Receptive Language Assessment

When receptive language skills were assessed by the *PPVT-III*, children correctly answered a mean of 73.2 items, with Raw Scores ranging from 21 to 109 correct. These Raw Scores

converted to Standard Scores that ranged from 54 to 131, with a mean Standard Score of 103.4 for the 387 assessed children. This equates to an average performance at the 58th percentile, when compared to the sample of children on which the *PPVT-III* was standardized. It is worth notice that two-thirds of the children in the present sample, 258 of 387 (66.7%), scored at or above the norm Standard Score of 100.0.

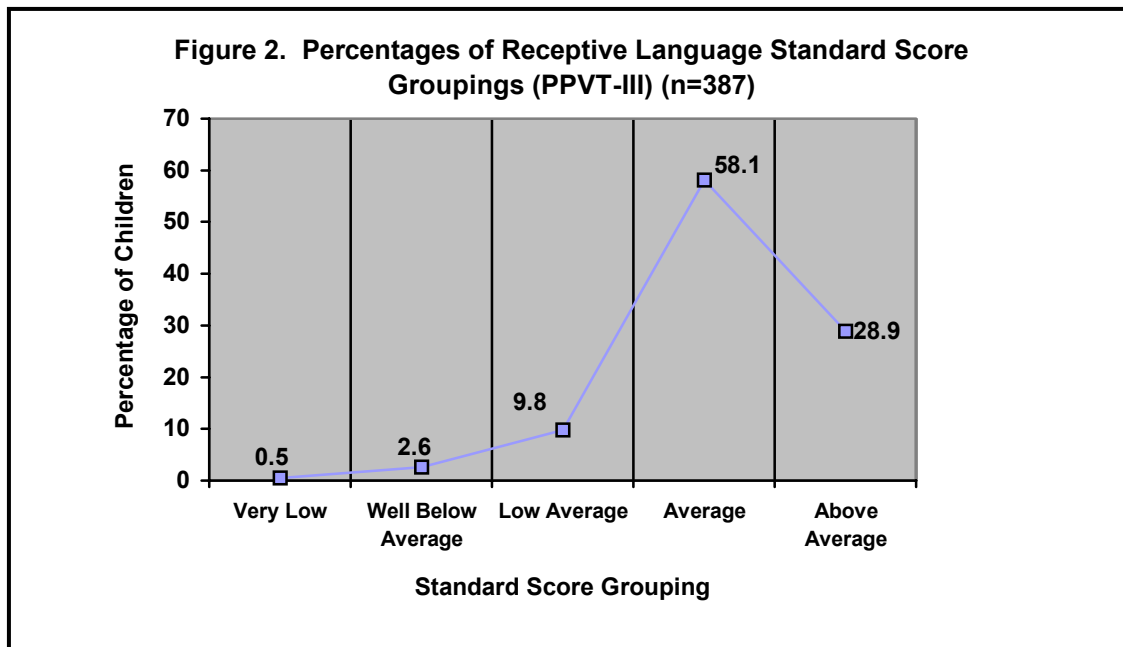
Age Equivalent Scores on the *PPVT-III* ranged from 20 to 126 months, compared to the children's chronological ages ranging from 55 to 71 months. The mean age of 62 months 24 days compared to the mean Age Equivalent Scores of 67 months. This difference indicates that children, on average, received scores of children 4 months 6 days older than their chronological ages. Of the 387 children assessed, 260 children (66.9%) received an Age Equivalent Score equal to or greater than their chronological age. Information in Table 6 compares the *PPVT-III* scores of the children to both the deviation-type norms and developmental-type norms.

Table 6.

**Receptive Language Assessment Results (PPVT-III)
(n=387)**

PPVT-III Deviation-Type Norms		PPVT-III Developmental-Type Norm Information		
Mean Standard Score ^a	Mean Percentile Rank ^b	Mean Age Equivalent Score ^c	Mean Chronological Age ^c	Mean Difference: Age Equivalent Score and Chronological Age ^c
103.4 ^a	57.6 ^b	67.0 ^c	62.8	+4.2
^a Standard Score is normed with a mean of 100.0 ^b Percentile Rank is normed with a mean of 50.0 ^c In months				

To determine the incidence of children achieving at remedial levels in receptive language, the Standard Scores of the *PPVT-III* were grouped, as shown in Figure 2. According to the technical manual for the *PPVT-III*, a Standard Score of 100.0 and a standard deviation of 15.0 equates to scores between 90 and 110 noted as "average," scores between 80 and 89 noted as "low average," scores between 70 and 79 noted as "low, i.e., well below average" and scores 69 and below noted as "very low." Accordingly, 38 of the 387 children (9.8%) scored lower than average, 10 (2.6%) scored well below average, and 2 (0.5%) scored even lower. Thus, a total of 50 children (12.9%) scored below the average range on receptive language skills.



Assessment of Letter-Word Recognition

The *WJ-III Letter-Word Identification* assessment determined children's skills in letter and word identification. In this assessment battery, items 1-4 required the child to match a rebus with an actual picture of the object, while items 5-13 presented isolated letters for identification and items 14-57 presented isolated words for identification.

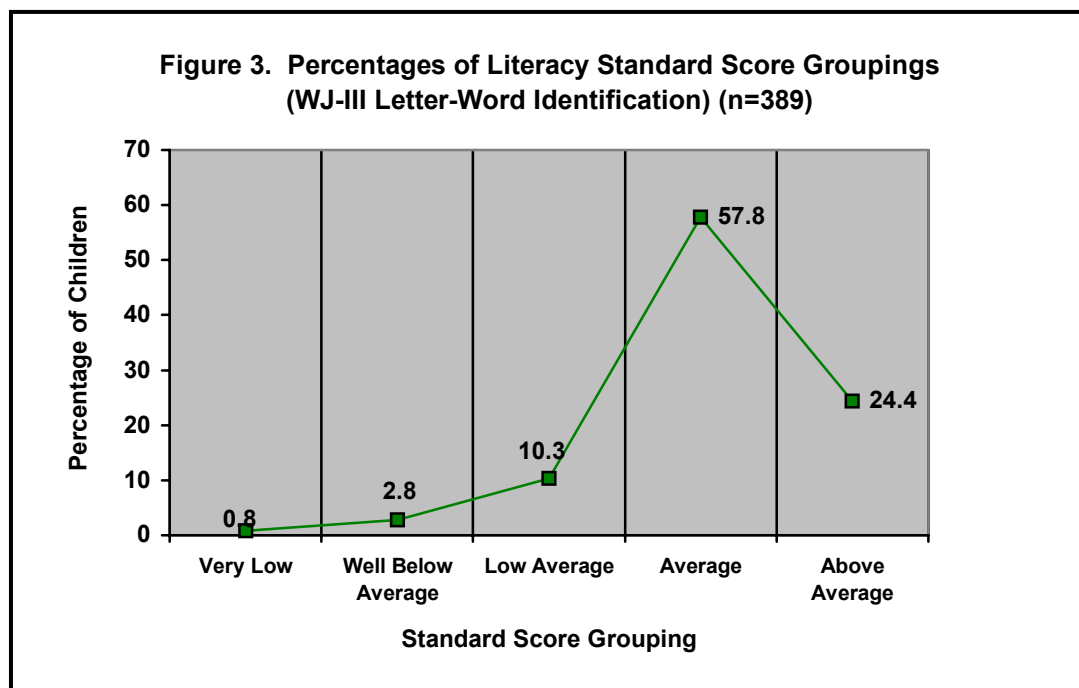
The mean Raw Score for the 389 children was 11.1, with scores ranging from 0 to 51. This score was converted to a Standard Score, which ranged from 49 to 214, with an overall mean of 102.7. The Standard Score was above the national norm, standardized at 100.0. The assessed children ranked at the 55th percentile, on average. The children's mean Age Equivalent Score was 64 months 9 days, compared to their mean chronological age of 63 months 9 days. In other words, the children performed at the level of children 1 month older than their ages, on average. Of the 389 children assessed, 242 children (62.2%) achieved an Age Equivalent Score equal to or greater than their chronological age. Table 7 presents the findings for this assessment.

Table 7.

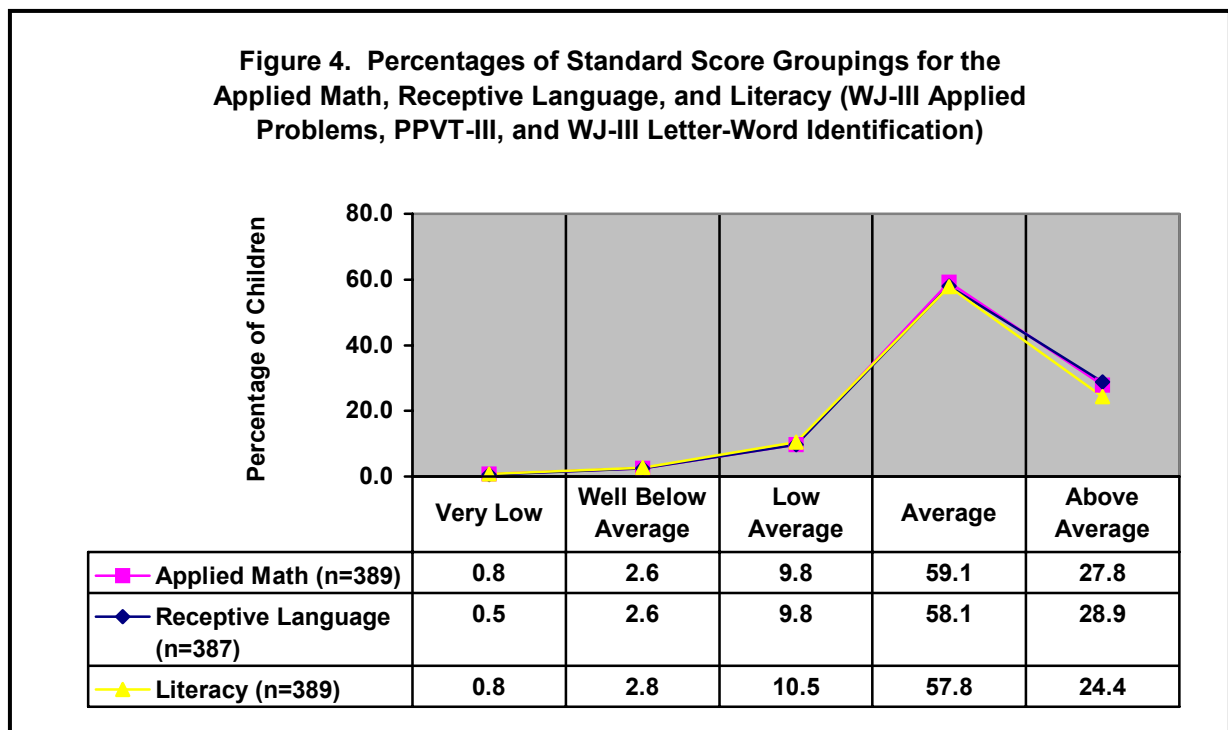
Literacy Assessment Results (WJ-III Letter-Word Identification)
(n=389)

WJ-III Letter-Word Identification Deviation-Type Norms		WJ-III Letter-Word Identification Developmental-Type Norm Information		
Mean Standard Score ^a	Mean Percentile Rank ^b	Mean Age Equivalent Score ^c	Mean Chronological Age ^c	Mean Difference: Age Equivalent Score and Chronological Age ^c
102.7 ^a	55.5 ^b	64.3	63.3	+1.0
^a Standard Score is normed with a mean of 100.0 ^b Percentile Rank is normed with a mean of 50.0 ^c In months				

Just as in the *Applied Problems* and *PPVT-III* assessments, Standard Scores for the *Letter-Word Identification* can be grouped to determine the degree to which children score below average. According to the *WJ-III* manual, scores between 90 and 110 are "average," scores between 80 and 89 are "low average," scores between 70 and 79 are "low, i.e., well below average" and scores 69 and below are "very low." Accordingly, 40 of the 389 children (10.3%) scored in the low average range, 11 (2.8%) scored well below average, and 3 (0.8%) scored even lower. This equates to a total of 54 children (13.9%) below the average range. Figure 3 provides additional detail.



Children's scores on the *Applied Problems*, the *PPVT-III*, and the *Letter-Word Identification* may be viewed collectively as they share the same Standard Score groupings. Thus, Figure 4 displays the frequencies of Standard Score groupings for pre-kindergartners on all three academic measures. One should note that the percentages of children performing at each level are remarkably similar for each of the three standardized instruments. Altogether, 108 of the 390 children performed below average on at least one of the three standardized assessments, which is 27.6% of the sample assessed. Of these 108 children, 70 children (64.8%) performed at a remedial level in just one assessment instrument, while 30 children (27.8%) performed remedially in two assessments and 8 children (7.4%) performed remedially in all three assessments. Allowing for the fact that the assessment of a given child may not have been representative on a given day, this is still a sizeable portion of the total sample of children assessed.



Assessment of Other Reading-Related Skills

Although children in this study were not assessed for their ability to read, such pre-reading skills as book-handling, reasoning, and listening were assessed. Of 389 children, 373 (95.9%) could distinguish between the front and back cover of the book, and 364 of 388 (93.8%) could also open the book to the title page or the first page to begin reading. When asked to point to printed words ("Point to where I should start to read"), 274 of the 385 children assessed (71.2%) were able to point to some print on the page. When asked to identify the title of the book on the front cover, 344 of 389 children (88.4%) could point to the title; when shown the author's name and asked what an author does, 207 of 389 children (53.2%) gave an appropriate reply.

Assessors determined the children's reasoning ability by reading portions of the story and asking open-ended questions. For example, 240 of 389 children (62.0%) provided appropriate reasons when asked why a pair of mittens might be hanging on a drying rack. Assessors also asked the children why the old lady whispered "hush," with 300 of 387 children (77.5%) generating an appropriate reason. Later during the reading of the story, assessors asked, "What do you think the bunny is doing now?". Of the 389 children assessed, 361 (92.8%) were able to give an appropriate reply. After completion of the story, assessors asked the children to recall the things that were told "good night" to in the story. Of 388 children, 340 (87.6%) could recall 3 or more things, 21 children (5.4%) could recall two, 15 children (3.9%) could recall at least one, and 12 children (3.1%) could not recall any.

Social Skills Rating System Assessments by Parents and Teachers

Parent Assessment of Child Social Skills

Parents assessed their children's social skills through the parent-rated *SSRS* questionnaire. In the parent-rated *Social Skills Scale*, the Raw Scores for the behavior domains of *cooperation*, *assertion*, *responsibility*, and *self-control* are summed and converted to an overall Standard Score, comparing the child with others of the same gender at the preschool level.

Parent Ratings of Social Skills were completed by 234 of the 390 parents of pre-kindergarten children participating in this study, a response rate of 60.0% of the children who were assessed. Included among the respondents were 222 mothers (94.9%), 9 fathers (3.8%), and 2 grandparents (0.9%), and 1 mother/father pair completing the scale together (0.4%).

Social Skills Scale Raw Scores for the 234 assessed children ranged from 0 to 74 (mean of 53.1). These converted to Standard Scores ranging from 69 to 131, with a mean of 103.2, equating to average child performance at the 57th percentile. One hundred sixty-eight of the 234 parents (71.8%) rated their children as having average social skills, while 24 (10.3%) indicated that their child had fewer social skills, and 42 (17.9%) indicated that they had more social skills than expected for their gender at the preschool level. Fewer than 15% of children received below average ratings on *cooperation*, *assertion*, *responsibility*, or *self-control* domains, according to the parent assessments. Table 8 displays the parent assessment of social skills.

Table 8.

**Social Skills Assessment by Parents
(n=234)**

Social Skills Scale	Fewer than Average Social Skills ^a % (n)	Average Social Skills ^a % (n)	More than Average Social Skills ^a % (n)	Mean Raw Scores (n=234)	Mean Standard Score ^a (n=234)
Cooperation	12.0% (28)	76.1% (178)	12.0% (28)	13.1	
Assertion	10.7% (25)	73.1% (171)	16.2% (38)	15.2	
Responsibility	6.8% (16)	88.0% (206)	5.1% (12)	11.6	
Self-Control	12.4% (29)	70.5% (165)	17.1% (40)	13.5	
SOCIAL SKILLS SCALE	10.3% (24)	71.8% (168)	17.9% (42)	53.1	103.2 ^b
^a Compared to peers of the same gender in the same school level, standardized at 100.0, with scores at 100.0 or above desired					
^b Available for Total Social Skills Scale only, with Standard Score boundaries of 69 and 131					

Teacher Assessment of Child Social Skills

Similarly, preschool teachers assessed the social skills of the participating children, using the *SSRS* teacher questionnaire. Teacher assessments were completed for 344 of 390 pre-kindergartners, a response rate of 88.2%. All of the responding teachers of the participating children were female.

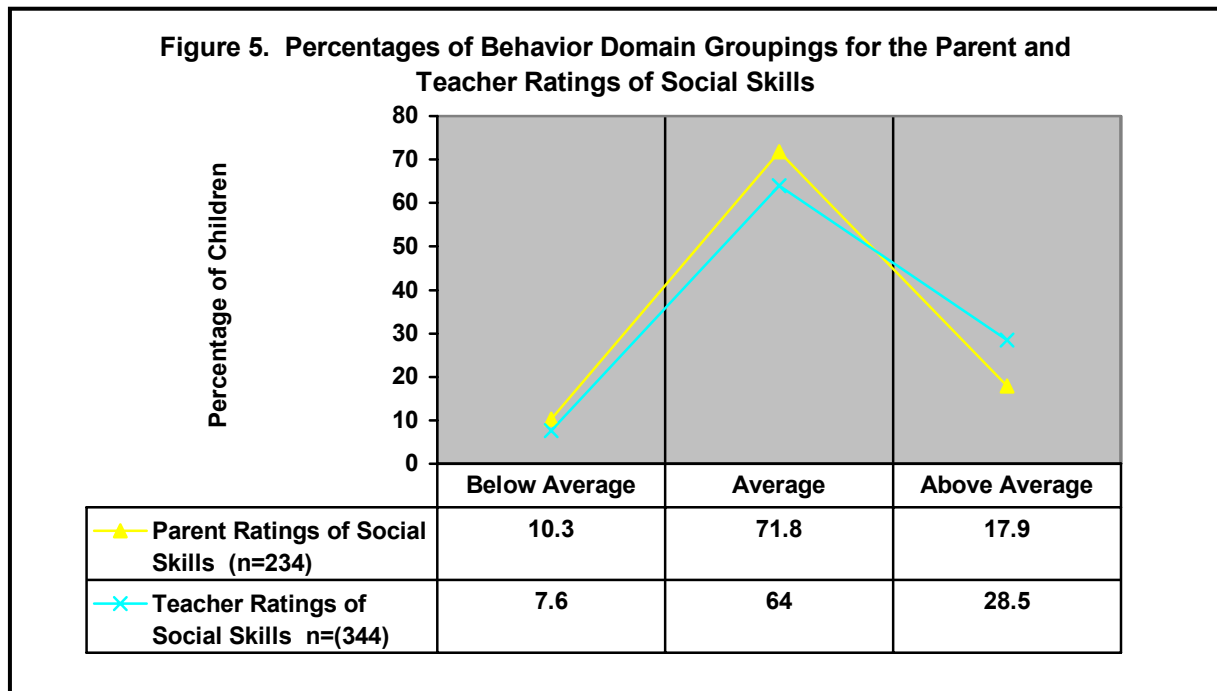
Raw Scores for the 344 pre-kindergartners on the *Social Skills Scale* ranged from 12 to 97, for a mean Raw Score of 44.6, according to their preschool teachers. These equated to Standard Scores that ranged from 64 to 137, with a mean of 106.7, equivalent to the 63rd percentile. According to teachers' assessments, 220 of the 344 children (64.0%) were rated as showing average social skills, while 26 children (7.6%) were rated as showing fewer social skills and 98 children (28.5%) were rated as showing more social skills than expected for their gender and preschool level. Overall, teachers rated fewer than 15% of the pre-kindergarten children as having below average social skills in each of the domains of *cooperation*, *assertion*, or *self-control*. Table 9 displays the findings for the *Social Skills Scale* and the three behavior domains for the pre-kindergartners, according to their preschool teachers.

Table 9.

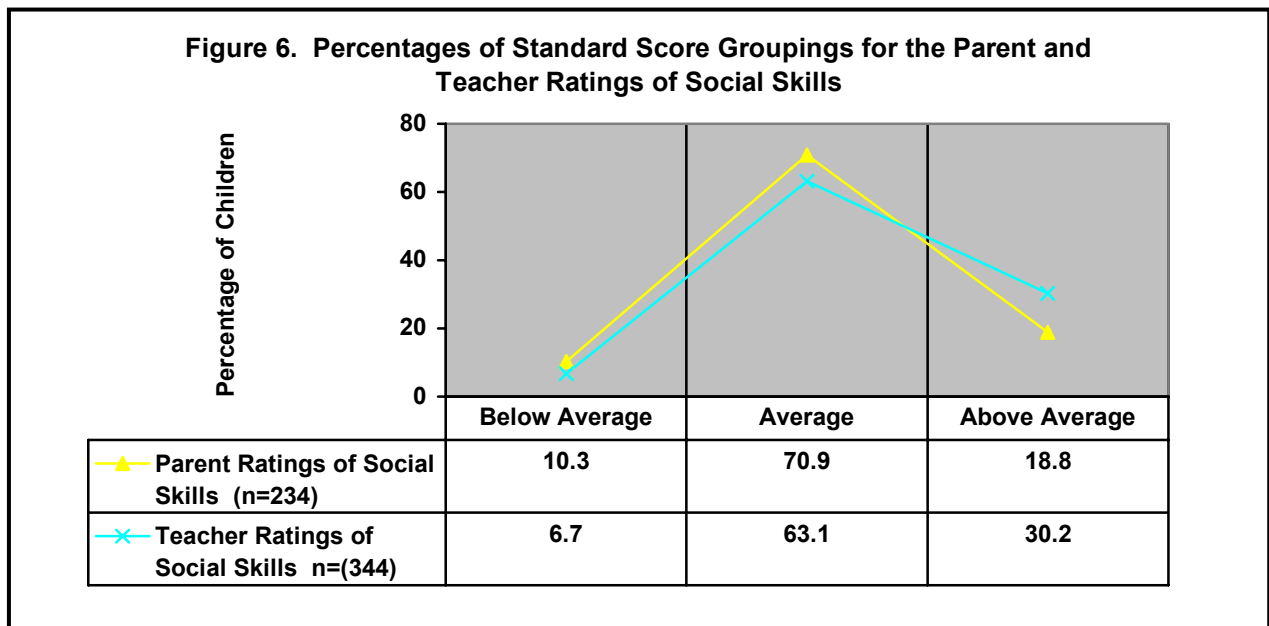
**Social Skills Assessment by Teachers
(n=344)**

Social Skills Scale	Fewer than Average Social Skills ^a % (n)	Average Social Skills ^a % (n)	More than Average Social Skills ^a % (n)	Mean Raw Scores (n=344)	Mean Standard Score ^a (n=344)
Cooperation	7.8% (27)	75.3% (259)	16.6% (57)	15.6	
Assertion	6.7% (23)	71.5% (246)	21.8% (75)	14.5	
Self-Control	10.8% (37)	67.2% (231)	22.1% (76)	14.3	
SOCIAL SKILLS SCALE	7.6% (26)	64.0% (220)	28.5% (98)	44.6	106.7 ^b
^a Compared to peers of the same gender in the same school level, standardized at 100.0, with scores at 100.0 or above desired					
^b Available for Total Social Skills Scale only, with Standard Score boundaries of 64 and 131					

The authors of the *SSRS* give two alternatives for determining social skills that are considered different from average. The first of these is based on functional developmental norms, as already shown in Tables 8 and 9. Scoring directions for these categories determined the percentages of children with scores that are average, below average, and above average within each domain and for the total scale. These have also been collapsed into Figure 5 to graphically show how the pre-kindergarten children were rated by their parents and teachers.



The second procedure for identifying children outside the range of “average” uses the deviation from the Standard Score as the determinant. A *Social Skills* Standard Score that is one standard deviation below 100.0, i.e., 85 or lower, is considered to be well below average on social skills. Parent assessments of pre-kindergartners indicated that 24 of 234 children (10.3%) exhibited below average social skills. The teacher assessments rated 23 of 344 children (6.7%) as exhibiting lower than average social skills. This information is presented in Figure 6, which shows the *Parent and Teacher Ratings of Social Skills* in Standard Score groupings. While the findings using these two approaches differ only slightly, the first approach measures the degree to which children functionally differ from average, while the second approach measures how far their scores differ from those of the normative population.



Comparison of Parent and Teacher Social Skills Assessments of the Same Children

Both a parent and a teacher completed an assessment of the social skills of 209 of the pre-kindergarten children. It is helpful to know whether these scores are similar. If they are not, it does not necessarily mean that either assessor was inaccurate; it may in fact mean that the child exhibited different behavior in different settings. Differences might also suggest that the frame of reference used by the assessor was different. For example, a teacher may have compared the child to other children in this classroom or to all children taught previously. The parent may have compared the child to other children in the family or the neighborhood, including those of different ages and gender.

Using paired t-tests, the mean *Social Skills* ratings of parents and teachers were compared. Teachers of these 209 children assessed them as having more social skills (mean of 107.3) than parents did (mean of 103.2) [$t(208) = -3.274$, $p = .001$].

Parent Assessment of Problem Behaviors

Parents also assessed their children's problem behaviors through the *SSRS* questionnaire. It is important to note that lower scores are more desirable on the *Problem Behaviors Scale*, as they reflect less problematic behavior. Parents assessed their children's tendency toward exhibiting problem behaviors, using the following behavior domains: *externalizing problems* and *internalizing problems*.

Problem Behaviors ratings were completed by parents of 234 of the 390 children in the study (60.0%). Their Raw Scores ranged from 0 to 20, for an average of 5.3. When converted to Standard Scores, the range was 84 to 145 and the mean was 96.5, equating to mean performance the 41st percentile. Fewer than 10% of the assessed children exhibited either *externalizing problems* or *internalizing problems*, according to their parents. Table 10 presents the findings for the parent-rated *Problem Behaviors Scale* and the two behavior domains for the 234 children.

Table 10.

Problem Behaviors Assessment by Parents (n=234)

Problem Behaviors Scale	Fewer than Average Problem Behaviors ^a % (n)	Average Problem Behaviors ^a % (n)	More than Average Problem Behaviors ^a % (n)	Mean Raw Scores (n=234)	Mean Standard Score ^a (n=234)
Externalizing Problems	28.6% (67)	64.5% (151)	6.8% (16)	4.3	
Internalizing Problems	0.9% (2)	93.6% (218)	5.6% (13)	1.0	
PROBLEM BEHAVIORS SCALE	22.6% (53)	67.9% (159)	9.4% (22)	5.3	96.5 ^b
^a Compared to peers of the same gender in the same school level, standardized at 100.0, with scores at 100.0 or below desired					
^b Available for Total Problem Behaviors Scale only, with Standard Score boundaries of 84 and 145					

Teacher Assessment of Problem Behaviors

Problem Behaviors Scale ratings by teachers are available for 342 children in this study (87.7% of the sample), with the same behavior domains as the parents used: *externalizing problems* and *internalizing problems*. Raw Scores ranged from 0 to 16 for a mean of 4.1. These scores converted to Standard Scores ranging from 84 to 134, with a mean Standard Score of 99.0 (showing less problematic behavior than the national norm of 100.0). In other words, the pre-kindergartners in this sample exhibited problematic behavior at the 47th percentile. Teacher ratings indicated that fewer than 15% of the assessed children exhibited *externalizing problems*, and fewer than 15% exhibited *internalizing problems*. Table 11 presents the teacher-rated

Problem Behaviors Scale and the two behavior domains for the pre-kindergarten children in this sample.

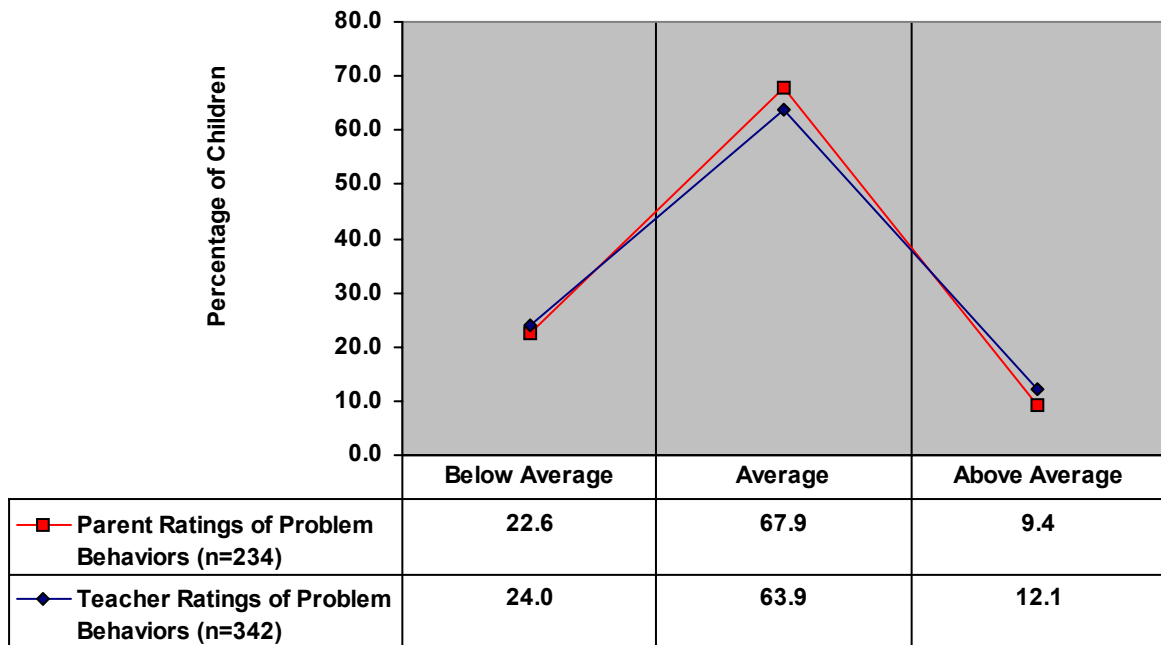
Table 11.

**Problem Behaviors Assessment by Teachers
(n=342)**

Problem Behaviors Scale	Fewer than Average Problem Behaviors^a % (n)	Average Problem Behaviors^a % (n)	More than Average Problem Behaviors^a % (n)	Mean Raw Scores (n=342)	Mean Standard Score^a (n=342)
Externalizing Problems	12.0% (41)	75.1% (257)	12.9% (44)	3.0	
Internalizing Problems	0.6% (2)	90.9% (311)	8.5% (29)	1.1	
PROBLEM BEHAVIORS SCALE	24.0% (82)	63.9% (218)	12.1% (42)	4.1	99.0 ^b
^a Compared to peers of the same gender in the same school level, standardized at 100.0, with scores at 100.0 or below desired					
^b Available for Total Problem Behaviors Scale only, with Standard Score boundaries of 84 and 134					

The authors of the *Social Skills Rating System* give two alternatives for determining problem behaviors for young children that are considered different from average. One is based on functional developmental norms, while the other is based on deviatinal norms. First, the authors provide scoring directions for determining the percentages of children with average, below average, and above average scores in each functional domain, as well as on the total scale. This approach categorizes children in how far they are from the abilities typical for children of that age and gender. These have been shown in the below average, average, and above average columns of Tables 10 and 11. To give a graphic comparison, the ratings for the total scale are also shown in Figure 7 according to the person completing the assessment (parent or teacher).

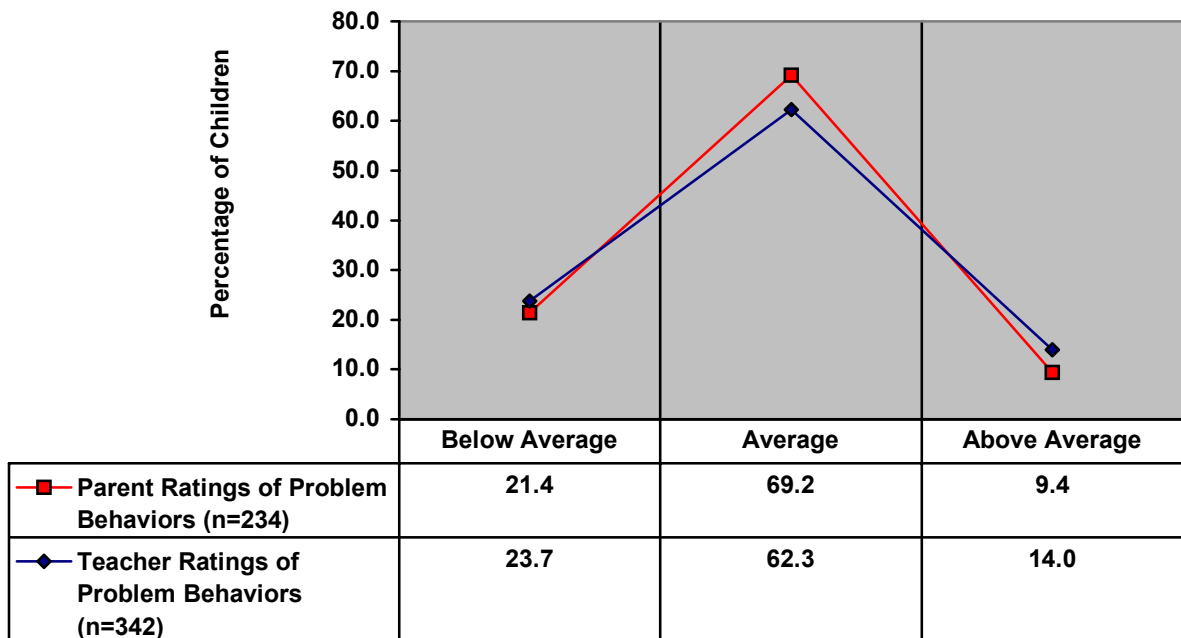
Figure 7. Percentages of Behavior Domain Groupings for the Parent and Teacher Ratings of Problem Behavior



The second approach identified by the authors is a determination of the standard deviations from the norm on the Standard Scale. A *Problem Behaviors* Standard Score that is one standard deviation above 100.0, i.e., 115 or higher, is considered to be well above average on problem behavior. Since the scale is reversed, scores that are higher (i.e., above average) are less desirable.

Parents reported that 22 of 234 children (9.4%) exhibited above average problem behavior. Teachers rated 48 of 342 children (14.0%) as exhibiting this degree of problematic behavior. This information is presented in Figure 8, which shows the parent and teacher ratings of children's problem behaviors in Standard Score groupings. In comparing Figure 7 with Figure 8, it is seen that these two approaches do not differ greatly. However, the two representations of the findings highlight different aspects of the difference from average, respectively, i.e., a functional or developmental difference from similar children and a deviation from the normative population's scores.

Figure 8. Percentages of Standard Score Groupings for the Parent and Teacher Ratings of Problem Behavior



Comparison of Parent and Teacher Assessments of Problem Behaviors

In 212 instances both the parent and the teacher assessed the problem behaviors of a pre-kindergarten child in this study. It is important to know whether these scores are similar, but differences do not mean that either assessor was inaccurate in their assessment. Differences may reflect actual differences in exhibited behavior or different frames of reference for the assessors.

Using paired t-tests, the mean *Problem Behaviors* Standard Score ratings of parents and teachers were compared. No statistically significant differences between parent and teacher ratings of problematic behavior were found for this sample of pre-kindergartners.

Findings about the Treatment and Comparison Groups

In this section of the report, data from both the Department of Social Services and the Department of Elementary and Secondary Education are combined. By combining data, we obtain a more comprehensive picture of early childhood education in Missouri. We also gain more confidence in the statistical analyses when we have larger sample sizes.

Child Comparisons

One of the requirements of HB1519 was to conduct a comparison between children in preschool programs funded by HB1519 (treatment group) and children in programs that did not receive funding from HB1519 (comparison group). In an ideal evaluation study, researchers would randomly assign children to groups and compare their performance on a variety of achievement measures. However, random assignment was not possible, given that HB1519 funding decisions were based on a competitive grant-seeking process.

The comparison group included preschool children in programs that were participating in the Workforce Incentive project, both center-based programs and family child care homes. Additionally, recently enrolled 3-year-old children in HB1519 programs who had not attended the infant/toddler classroom during the prior year were selected as a comparison group for the children who had attended the infant/toddler classroom.

When examining the characteristics of the treatment and comparison groups, it was found that the groups differed on important factors believed to be related to children's achievement, such as level of observed program quality, teachers' years of education, teachers' length of time in field, teacher's training hours in the past year, and parental level of education.

- Programs in the treatment group scored higher on quality of programs and had teachers with more education and training.
- Programs in the comparison group had teachers with more experience and parents with more education.

Creation of a Matched Comparison Group

In order to control for these differences between the treatment and comparison groups, children from the comparison group (programs NOT receiving HB1519 funds) were matched with children from the treatment group (programs receiving HB1519 funds) on the following variables: parental years of education, observed program quality, teacher's years of education, number of teacher training hours in the past year, and teacher's length of time in the field. This process created a set of 77 paired subjects that are similar on these important characteristics.

Child Assessment Outcomes

The following standardized child assessments were completed as part of the HB1519 evaluation:

- *Peabody Picture Vocabulary Test, Third Edition (PPVT-III)* to assess receptive language;
- *Woodcock-Johnson III (WJ-III)* –
 - *Letter Word Identification* to assess literacy skills;
 - *Applied Problems* to assess mathematical skills;
- *Social Skills Rating System (SSRS)* –
 - *Parent Rating of Social Skills* to assess social skills from the parent perspective;

- *Parent Rating of Problem Behaviors* to assess problematic behavior from the parent perspective;
- *Teacher Rating of Social Skills* to assess social skills from the teacher perspective; and
- *Teacher Rating of Problem Behaviors* to assess problematic behavior from the teacher perspective.

One-tailed t-tests were used to compare the mean standard scores for children in the treatment and comparison groups on the seven standardized instruments. Standard scores are normed at 100.0 for each instrument. In all instruments, with the exception of the two *Problem Behaviors* scales, higher scores indicate higher achievement and are thus desirable. For the *Parent Rating of Problem Behaviors* and *Teacher Rating of Problem Behaviors* higher scores indicate more problem behaviors, so lower scores are desirable on these scales. Table 12 shows the mean standard scores for the two groups.

Table 12.
Mean Standard Scores on Child Assessments for Treatment and Comparison Groups

Assessment Instrument	Treatment Group Mean (SD)	Comparison Group Mean (SD)	<i>n</i>
PPVT-III	108.4 (11.0)	105.2 (17.3)	77
WJ-III Letter-Word Identification	107.5 (13.9)	104.5 (16.3)	77
WJ-III Applied Problems	107.0 (12.9)	106.1 (89)	77
Parent Rating of Social Skills	105.1 (13.5)	103.2 (12.7)	76
Teacher Rating of Social Skills*	110.1 (14.3)	106.3 (12.7)	63
Parent Rating of Problem Behaviors	94.3 (10.0)	95.0 (12.3)	76
Teacher Rating of Problem Behaviors*	96.3 (12.5)	101.2 (12.8)	64
*Indicates a statistically significant difference, $p < .05$, one-tailed.			

As shown in Table 12, the children in the treatment group outperformed their peers in the comparison group on every instrument. On two measures — *Teacher Rating of Social Skills* and

Teacher Rating of Problem Behaviors — the differences between the two groups were statistically significant.

Summary

This concludes the report of child assessment results for children attending Missouri Preschool Project programs for at least 1 year. Some encouraging findings include the following:

- On average, the standardized math scores of the children attending Missouri Preschool Project programs were higher than the norm of 100, equaling performance at the 55th percentile (i.e., performing better than 55% of those in the normative sample).
- Children also performed above the norm on the receptive language assessment, with average performance at the 55th percentile.
- Similarly, mean standardized scores on the assessment of their reading-related skills were higher than average, equivalent to performance at the 55th percentile.
- Both parent and teacher assessments found children to be above the norm on social skills and below the norm on problem behaviors, on average.
- Children in the treatment group of this study who attended HB1519-supported programs outperformed children in a comparison group who were matched on parental years of education, observed program quality, teacher's years of education, number of teacher training hours in the past year, and teacher's length of time in the field.

References

- Brown, M. W. (1947). *Goodnight moon*. New York, NY: Harper Collins.
- Dunn, L. M., Dunn, L. M., & Dunn, D. M. (1997). *Peabody Picture Vocabulary Test-Third Edition*. Circle Pines, MN: American Guidance Service (AGS).
- FACES Research Team. (1997). *Family and Child Experience Survey*. Washington, D.C: U.S. Department of Health and Human Services, Administration for Children and Families, Head Start Bureau.
- Gresham, F. M., & Elliott, S. N. (1990). *Social Skills Rating System*. Circle Pines, MN: American Guidance Service (AGS).
- Mason, J. M., & Stewart, J. (1989). *The CAP Early Childhood Diagnostic Instrument* (prepublication edition). American Testronics.
- Missouri Department of Elementary and Secondary Education. (1998). *Project Construct Assessment System*. Jefferson City, MO: Author.
- National Education Goals Panel. (1998). *Principles and recommendations for early childhood assessments*. Washington, DC: U.S. Government Printing Office.
- Woodcock, R. W., McGrew, K. S., & Mather, N. (2001). *Woodcock-Johnson III*. Itasca, IL: Riverside.